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# Decreasing Damaging Effects of Stress-Bound Situations: Toward a New Model of Leadership Under Stress: Final Report

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New University of Lisbon (Portugal)

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## 16. SUPPLEMENTARY NOTATION (Continued)

A detailed version of "study 1" published as "coping with stress in a military setting: Marines in war and peace," in D. Canter et al. (eds.), Environmental Social Psychology, 197-218, NATO ASI Series, D-45, Kluwer Academic Publishers (1988) and at Rev. Port. Med. Militar, 35, 1987 (4-20). Intermediary reports presented at International Applied Military Psychology Symposia at Rome (1986) and Lisbon (1987).

## 18. SUBJECT TERMS (Continued)

Organizational behavior  
Organizational stress

## 19. ABSTRACT (Continued)

that a model of leadership under stress should be contingent upon the particular organizational pattern and culture.

To test a possible model, a quasi-experimental study trained 18 instructors and observed 299 trainees in two conditions and in two courses. It was found that, when the instructors gave high or low support to their trainees, the trainees' stress levels, satisfaction, and performance varied accordingly, and that 1 year after, the instructors' behavior had an enduring influence in the adaptation of marines to their regular duties. (SDM)

On the basis of the study results, two models may be postulated: (1) Formal leaders and, moreover, authoritarian ones, in situations of high organizational stress, become confounded with the organization and are unable to manage the trade-off between the follower's performance and satisfaction. They become a source of stress contributing to the new increases of organizational stress. (2) On the contrary, discretionary leaders, as they have to stand in between the organization and the followers, are able to increase or decrease their strain by withholding or providing support, respectively, and, as a consequence, to manage the trade-off performance and satisfaction.

The present series of studies stresses the need to consider stress as crucial intermediary variables in studies of leadership and organizational behavior.

A review of first year research is available in RN 87-01.

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## ***Decreasing damaging effects of stress-bond situations***

In the battlefield of the future the number of stress reaction casualties is expected to outnumber, by far, all the other types of casualties. Group morale and leadership are two, empirically tested ways to prevent, as far as possible, such undesired events, provided they are correctly managed in training and in action (Pereira and Jesuino 1986).

If low stress undermines motivation to perform efficiently, too high stress may disrupt goal-directed behavior up to sideration or helplessness.

For groups to function at an optimal level, situational stress should be contained within specific up and down boundaries. That is, in most action situations, a direct function of the leader. Although, such action should be prepared by appropriate training, both of the group members and of the group leaders. As such it constitutes an organizational behavior management problem.

To solve the problem, specially in military settings, personal experience is important but, usually not sufficient. A theoretical effort in connection with empirical studies should provide guidelines for instructors and military leaders to deal with the problem in the different organizational interfaces it comes about.

Our previous research provided results pertinent to approach the problem solution but much more should be done to increase the likelyhood of its practicability. (See table 1)

In jobs or tasks where there is no possibility to avoid stress, e.g. combat action, repeated exposure is likely to produce relatively permanent damage in groups or individuals. Previous research by Pereira (from 1964 to 1981) demonstrated such outcome for marines involved in counterguerrilla activity. As high unit morale prevented somewhat the psychosomatic disturbances detected, Pereira and Jesuino (1982), using Fiedler's model as framework, demonstrated that appropriate leadership style buffers unwanted stress consequences. To understand how such effect comes about the authors developed and began testing a model of leader group transactions in a field study using 239 men, about 10% of the Portuguese Marine Corps population, and present day training of marines as setting. The results of direct observations, interviews and questionnaires show that leadership behavior, namely its discretionary component has a significant bearing on the stressors-strain interface. Professional competence, specially, bureaucratic expertise, is a prerequisite for the leaders acceptance by the subordinates and vice-versa. Traditional structuring and consideration factors of leadership are contingent upon the diadic relations between leaders and subordinates and on the group atmosphere and cohesion (Pereira and Jesuino, 1986, final report). (See table 2)

As it was also found that strain was maximum during marine training, a longitudinal study on the population of 28 Naval Reserve cadets during the nine months course, at the Marine School, including personality and group measurements, was conducted, revealing that stress levels decrease with time and adaptation, according to a pattern similar to the one found in small group research.

When we move to different populations like firemen, civil servants and professionals of the service sector the importance of high organizational stress strongly contrasts with the marine data, and emphasizes even more the importance of stress measures as organizational criteria.

That is to say that after isolating the relevant variables to construct a model of leadership under stress, we found that the particular configuration of the interrelations among such variables is ultra-contingent, upon group atmosphere, group cohesion, the particular organizational pattern and the culture related to it. (Pereira and Jesuino, 1987, final report).

An important shortcoming of the above studies on the marines is concerned with the absence of performance measures. (Self-ratings were the only measures used).

The Marine Corps uses the same rating system as the Portuguese Navy, a non-specific rating system. The use of such information for the purposes of our studies is also difficult because for conscripts, only a very simplified version of the general rating is used.

The only time and place in which detailed and reliable performance measures are taken is the instruction period at the Portuguese Marine School.

As we have found in the studies above the training period at the School is the one in which stress levels reach their highest. It became mandatory to study the marines in the course of their training.

After we have completed the study with the conscript cadets, two other broader range studies were envisaged. They were conducted according to the same design.

It is obvious that leadership in a military school is somewhat different from leadership in an ordinary military unit. Except for the higher levels, close leadership is exercised, quite exclusively, by the trainees'instructors. That may be a shortcoming but there is, although, one advantage to deal with such type of leadership as it is much more pattern bound, and, accordingly it can be much more reliably shaped in accordance to a pre-established plan.

In our previous studies we confronted, at one given moment, variables related to the trainees evaluation of leaders. Now we want to see what happens when one manipulates the leadership behavior of the instructors, using as criteria variables pertaining to their subordinates, i.e. the trainees. To be more specific, we want to see if when the instructors change their behaviors such change induces variations in the stress, the satisfaction, the intention to leave and also the performance of trainees submitted to it. 4

TABLE 1

## PREVIOUS STUDIES BY THE AUTHORS

STUDY	AIM	METHOD	CONCLUSION
Pereira (1974;1974a;1976)	Consequences of war stress	Field study in Guinee (1964-66) with follow-up to 1983 (marines)	Stress damages depend on time of exposure, are greater with intermitent action, are smaller in high morale units
Jesuino (1981,1982a,1986b)	Testing Fiedler model	Field study (Navy men) (civilians)	Mixed results
Jesuino (1984)	Leader-follower transactions	id.	Mediating function of normative group strategies.
Jesuino (1984c;1984d)	Testing SYMLOG	id.	Positive results, specially in military setting
Pereira & Jesuino (1982)	Role of Leader- ship style in buffering stress	Field study (marines) n=158	High LPC leaders reduce moderate stress of subordinates / low LPC leaders reduce lower stress of subordinates

TABLE 2  
STUDIES COMPLETED UNDER THE PRESENT PROJECT

STUDY	AIM	SUBJECTS	METHOD
<u>1</u> (1986)	<ul style="list-style-type: none"> <li>- Multilevel evaluation of stress and leadership within an extend set of variables.</li> <li>- Trial of methods of measurement.</li> </ul>	<p>Stratified random sample of 239 marines (10% of the population of Portuguese Marine Corps).</p> <p>(7 units)</p> <p>(8 hierarchical levels up to Lt. Cdr.)</p>	<p>Field study</p> <p><u>Instruments:</u></p> <p>Behavior observations (including exercises)</p> <p>Individual interviews (biographical, clinical and critical incidents)</p> <p>Collective interviews</p> <p>Multipurpose questionnaire.</p> <p>Self-rating scales</p>
<u>2</u> (1987)	Comparison Study	<p>Stratified random sample of 30 firemen (civilians)</p>	<p>Field study</p> <p><u>Instruments:</u></p> <p>Some as in study 1 (reduced)</p>
<u>3</u> (1987)	Comparison Study	<p>Non - representative sample of civilian clerical works in different firms</p> <p>n = 58</p> <p>(continued in 1988 with 117 subjects more).</p>	<p>Pilot study</p> <p><u>Instruments:</u></p> <p>Same as in study 1.</p>
<u>4</u> (1987)	Personality and group factors on stress appraisal over time	<p>28 marine cadets (the full Naval Reserve course of 1986)</p>	<p>Longitudinal field study</p> <p><u>Personality measures:</u></p> <p>M.M.P.I.</p> <p>T.S.C.S.</p> <p><u>Group measures:</u></p> <p>SYMLOG</p> <p><u>Sequential appraisal m.:</u></p> <p>Shalit's WQ.</p> <p><u>Stress measures</u></p> <p>Miller &amp; Smith stress audit.</p>
<u>5</u> (1988)	<ul style="list-style-type: none"> <li>- To verify if the stress of subordinates is reduced when their leaders take adequate measures.</li> <li>- Replication of some aspects of study 1.</li> </ul>	<p>Two experimental groups (101 basic course trainees and 81 technical course trainees) and two control groups (respectively, 30 and 79 trainees) plus 18 Marine School instructors.</p>	<p>Quasi-experimental longitudinal study.</p> <p>Two experimental conditions induced by training the school instructors.</p> <p><u>Instruments for trainees</u></p> <p>Same as in study 1 plus performance measures</p>

In order to perform such a quasi-experimental study we have to start by training the instructors to behave toward the trainees on a standard way. As we want to have a control group the only way around is to train just half of the instructors, at random. To make it believable, and with the accordance of the School Director, the instructors were told that half of them would have to follow a leadership course in the present term, and, because of organizational constraints, the other half would have to have the same course only in the next term.

When we first contacted the instructors we asked them not to tell the others what was going on. We explained that we were looking for new methods of instruction and if they would tell the others, they would «scramble» the changes of the other ones to follow the «same» course in the next term.

We have reasons to believe that this manipulation worked well and that nobody connected the leadership course to the instructors with the evaluations of trainees, as it is a common procedure of the Psychological Department of the Portuguese Navy to evaluate trainees from time to time.

Notwithstanding, the above belief we took steps to evaluate if the instructors did or did not comply with our instructions on how to evaluate and how to behave toward their trainees.

It was found that when the instructors give high support to the trainees, the stress levels decrease, satisfaction increases, but performance becomes worst. On the contrary, when the instructors take in consideration the physical and psychological maturity of the trainees, and actually give them less support than in the previous case, the stress levels increase, the satisfaction decrease, but the performance is better.

The follow-up study, one year after, shows that the way the instructors behave in the Marine School, has enduring influence in the adaptation of marines to their regular duties. (Pereira and Jesuino, 1988).

### The Variables

The field studies reported here (table 2) reclaimed the use of a considerable number of methods and instruments ranging from clinical and critical incidents techniques up to correlational and quasi-experimental manipulations. (See table 3).

As a consequence a series of sets of variables was examined. A great number of the variables was directly related to the basic hypothesis — the buffering of stress levels by leadership behavior — others were included to counter-test the hypothesis, that is, to find out which sets of variables explain a greater proportion of the variance. We are speaking of the functional variables analyzed by multivariate correlation techniques. Besides, as we were also interested in determining the stress sources and what are the specific behaviors used by leaders and subordinates in their interactions a series of descriptive variables was also used. The relevant variables and their effects are summarized in table 4.

Taking into consideration the above information we turn to examine how the sets of variables interplay in, first, the correlation studies and, second, the longitudinal studies. That aspect is examined in detail. We conclude with a discussion of the possibility and shortcomings of the construction of a model of leadership under stress.

TABLE 3  
METHODS AND INSTRUMENTS  
USED IN THE FIVE STUDIES

---

1. Observations of behavior
  - in the barracks or offices
  - during field exercises including simulation of combat action.
2. Individual interviews
  - biographic
  - clinical
  - critical incidents
3. Collective interviews
  - with SYMLOG
4. Self - rating scales
  - job adaptation
  - ideal worker
5. Multipurpose questionnaire
  - based on Martin, Bernandi, Osborn and Hunt (1980) and including variables on:
    - task characteristics
    - leader behavior description (LBDQ)
    - system of rewards
    - cohesiveness
    - discretionary leadership
    - job satisfaction (JDI)
    - desirability
    - stress scales

(The number of variables (and of items) was reduced after study 1 according to the results.)
6. Personality measures (only in study 2)
  - MMPI
  - TSCS (Fitts, 1965)
7. Sequential appraisal measures
  - VQ (Shalit's wheel, 1982)
8. Other stress measures
  - Miller & Smith stress audit (only in study 2)
  - General health questionnaire (only in study 5)
9. Maturity levels of subordinates (only in study 5)
  - Hershey & Blanchard (1982)
10. Performance measures (only in study 5)
  - Military ratings
  - School ratings

TABLE 4

RELEVANCE OF THE VARIABLES  
USED IN THE FIVE STUDIES

I. FUNCTIONAL VARIABLES

<u>A. INPUT VARIABLES</u>	<u>RELEVANCE</u>
1. Demographic	Negligible
2. Military	
- Hierarchical rank (up to lt. cdr.)	Mild
- Military units. Marine School	Mild
Within Marine Corps	Higher stress values. The more operational the higher the stress; on the other extreme boredom stress
3. Organizational	
- Task characteristics	
Quest. - STD	No main effects (statistical)
TSKSP	Interaction effects with dis-
TSKD	cretionary variables and JDI
TSKV	variables.
- System of rewards (SYRWD-Q.)	Main effects on strain
4. Leadership	
- Leader behavior descriptors (LBDQ)	
Quest. - LBD1 - LBD10	Relevant for military unit and rank differences but are <u>not</u> predictors of output variables (stress, - ITL, JDI and performance)

TABLE 4 (cont.)

- Discretionary leadership		
Quest. - DISRC		Main effects and very
DISRP		considerable interaction
DISWA		effects
DISSUP		
- Discretionary leadership factors		
Quest. - CONTROL		Not relevant when the previous four (DIS) are used.
PTPC		
FTRP		
PTSUP		
BCAMT		
BCFACE		
BCNPERI		
- Leaders orientation:		
Professional competence		Competence is preferred by
Person consideration		marines and civilians
- SYMLOG variables		Moderating effects
MMPI variables		(Only used with the cadets.)
Shalit wheel variables		
5. STRESS variables		
On-the-job stress (STR1)		Relevant
Out-of-the job stress (STR2)		Erratic
Organizational stress (STR3)		Very relevant specially with firemen and civilians

TABLE 4 (cont.)

B. <u>OUTPUT VARIABLES</u>	<u>RELEVANCE</u>
1. STRESS variables	
Strain (symptoms of stress) STR4	Very relevant (most expressive variable to characterize organizational behavior)
Estimated stress - STR5	Relevant to complement STR4
2. Intention to leave - ITL	Relevant. Most of all for civilians
3. Attitudes toward job	
Quest. JDI - WRK	Very relevant
CHIEF	(Main effects and interaction effects)
COLLG	
SLRY	
CAREER	
SATISF	
4. Self evaluations	Relevant
- Adaptation to job	
- Ideal worker	
5. Performance variables	Relevant
- Military informations	
- Marine school scores	

TABLE 4 (Cont.)

II. LONGITUDINAL VARIABLES

A. <u>Leader-subordinates</u> <u>transactions.</u>	EFFECTS:
1. <u>Incident solution tactics</u>	
used by superiors:	Positive influence, social support
- Direct help	
- Uncertainty reduction	
- Dramatization (humor)	
used by colleagues:	
- Direct help	Positive influence, social support.
- Abandon	Negative
2. <u>Goal - setting</u> <u>by instructors</u> (only in study 5)	Shaping of performance
3. <u>Disciplinary behaviors</u> <u>by superiors</u>	
Informal system of discipline (marines)	Increases cohesion
Enforcement of formal discipline (marines and firemen)	Increases organizational stress
Avoidance of exercising leadership (civilians)	Increases organizational stress

TABLE 4 (Cont.)

---

<b>4. Communication</b>	
Easy-going (marines)	Increases cohesion and social support
Rigid (formal) (firemen; civilians)	Increases organizational stress.
<b>5. Group integration</b>	
Progressive (cadets and marine trainees)	Reduces stress; increases cohesion and social support.
Limitations enforced (firemen; civilians)	Increases organizational stress
<b>6. Authoritarian tactics</b>	
(firemen)	Increases organizational stress
<b>B. Stress sources</b>	
<u>CONTINUENTES TO:</u>	
<b>1. Task related</b>	
Physical exercises (Marine School)	STR4 and STR5
Combat exercises (Marine Corps)	STR4 and STR5
Uncertainty about what next. (marines)	STR4

---

TABLE 4 (Cont.)

---

Uncertainty about task performance (Civilians)	STR3 and STR4
Perceived danger (marines (special units) and firemen)	Only immediate effects reported. Not relevant for firemen
2. <u>Organizational</u>	
Uncertainty about organizational politics	STR3, STR4, ITL, decrease in satisfaction.
Poor organization	STR3
In-group or inter-group conflict	STR3
Discipline	STR3
3. <u>Leaders</u>	
Authoritarian behavior	All the output variables.
Incompetence (professional)	
Inconsideration and aloofness (people)	
Evasion from responsibility	
4. <u>Colleagues</u>	
Abandon in critical incidents	STR3 and STR4
Isolation from group.	
5. <u>Salary and career</u>	
Reported systematically as insufficient in all studies	All the output variables.

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## CORRELATIONAL STUDIES

Study 1 conducted in the Portuguese Marine Corps supports the buffering model.

The sample was constituted by 239 marines. It amounts to approximately 10% of the population (2500 men) and takes into account the organizational structure of the Portuguese Marine Corps. The design was, thus, cross-sectional. For measuring the different variables a multipurpose questionnaire was used. (See table 5).

### Stress Measures

Assessment of stress was not limited to perceived job stress. The questionnaire included life-events check-lists separated in life-events (STR2) and on-the-job events (STR1). Both check-lists, comprising 20 items.

Perceived job stress was measured by a 15 item 3 point scale listing most usual organisational stressful events. Other scales used for assessing perceived job stress were:

- task characteristics (standardization, specification, variability and difficulty).
- attitudes toward job (JDI) — work, superior, salary, career perspectives and relationships with colleagues.

### Support Measure

The fundamental premise was that supervisors behavior would moderate the potential effects of stress on the strain (symptoms) of subordinates. The intermediary variables were measured by leader behaviour descriptions made by subjects. Two different scales were used:

— a 48 item scale comprising 11 factors: resources, role clarity, credibility, rules and procedures, work assignments, support, contact, consideration, bureaucratic expertise, technical expertise, predictability.

This scale was supposed to measure *formal leadership behaviour* as perceived by subordinates.

— A second scale, intended to measure *informal leadership behaviour* comprised 9 items grouped in 3 factors: rules and procedures, work assignments and support.

It was also posited that this second component of leadership behaviour — the discretionary leadership (Hunt & Osborn 1982) is a more important moderator than the first component of formal behaviour.

### Dependent Variables

For assessing the strain of subjects, that is to say, their reported symptoms, we have used a 15 item 3 point scale (STR 4) and a 1 item 10 point scale (STR 5) where subjects were asked to indicate their estimated consequences for health if actual job conditions were to continue unchanged for the next two years. The set of variables used in this study is listed in table 5.

The method used for testing the buffering hypothesis was the multiple regression analysis with cross-product term (stress x support) forced into the equation after the main effect terms for stress and support were accounted for. Due however to the small size of the sample it was not possible to analyse second order interaction effects.

The results obtained provide considerable support to the buffering hypothesis and also confirm that it is mostly the discretionary component of leadership behaviour that moderates the effects of stress. Table 6 a summarizes the most significant results obtained.

		items	(cross-sectional estimates of the reliability)
Task characteristics			
Standardization	STC	4	.50
Specialization	TSKSP	2	—
Difficulty	TSKD	2	—
Task variety	TSKV	3	.65
Leader Behavior/Descriptor			
Resources	LBD1	2	.76
Role clarity	LBD2	2	.77
Credibility	LBD3	2	.53
Rules and procedures	LBD4	2	.70
Work assignments	LBD5	2	—
Support	LBD6	2	.62
Control	LBD7	2	—
Consideration	LBD8	2	.50
Bureaucratic Expense	LBD9	2	—
Technical Expertise	LBD10	2	—
Proactivity	LBD11	2	—
System of rewards	SYRAD	3	.55
Cohesiveness	COMES	9	—
Discretionary leadership			
Rules and procedures	DISPP	3	.65
Work assignments	DISWA	2	.60
Support	DISUP	2	—
Intention to leave	ITL	3	.55
Job satisfaction (JD)			
Work	WFK	3	.84
Chief	CHIEF	1	.81
Colleagues	COLLG	6	.83
Salary	SALP	4	.76
Career	CAREER	5	.77
Satisfaction	SATISF	1	—
Discretionary leadership			
Control	CONTROL	1	—
Job clarity	PTBC	1	—
Rules and procedures	PTRP	1	—
Support	PTSUP	1	—
Contacts	BCAMT	1	—
Face to face	BCFACE	1	—
Non-personal	BCNPER	1	—
Desirability	DESIRAB	4	.33
Stress			
Stress type I (events on the job)	STR1	18	—
Stress type II (life events unrelated to job)	STR2	14	—
Stress type III (organizational stress)	STR3	9	.64
Stress type IV (self-described strain)	STR4	15	.83
Stress type V (estimated future strain)	STR5	1	—

CAUSAL STRUCTURE OF STRESS MEASURES. EACH PATH IS INDICATED BY THE SQUARED PART CORRELATION ( $R^2$ ). ALL THE VALUES ARE SIGNIFICANT AT LEAST OF THE .05 LEVEL

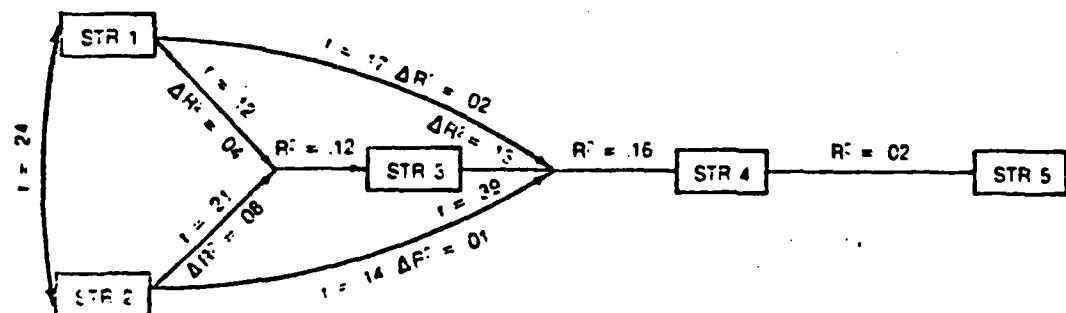


Table 5 — Variables in the questionnaire (study1) and path-analysis of the stress variables

TABLE 6  
MAIN AND MODERATED EFFECTS OF STRESS  
AND SUPPORT MEASURES ON STRAIN

Main effects	R <sup>2</sup>	p ( )
A. Formal leader behaviour	.11	.02
B. Discretionary leadership	.03	NS
C. Attitudes toward job	.20	.00
D. Task characteristics	.06	.02
E. Stressful events	.16	.00
F. System of rewards	.08	.05
Interaction effects		
A x F	.24	.05
B x C	.36	.00
B x D	.21	.01

The results suggest that, strictly speaking, formal leader behavior is to be considered a stress rather than a support measure. The discretionary leadership is the only measure of social support.

As a matter of fact, there might be some confounding of stress and support measurements due to the fact that stress measuring instruments and social support might, to some extent, be measuring the same thing.

Such a correction to the initial model does not substantially alter the buffering hypothesis formerly stated. On the contrary, it introduces more precision in the identification of the social support factors likely to moderate the occupational stress.

The findings show that discretionary leadership does not significantly interact with formal leadership behavior descriptions. This may be due to multicollinearity effects since both sets of variables are highly correlated.

All in all, it may be seen that discretionary leadership has a considerable heuristic value. Discretionary leadership produces no main effects on strain and significantly moderates stress variables towards job and task characteristics. In other words, it is the perceived discretion of supervisors that may reduce adverse effects of various occupational perceived stressors like difficult relationships with superiors and colleagues, negative aspects of salary and career, and negative aspects of the tasks to perform like standardization difficulty or lack of variety.

Although this is not the first study to focus on the role of supportive leadership practices (see Caplan et al, 1975; House & Rizzo 1972; Parasuraman & Alutto 1984), it should be stressed that it is, as far as we know, the first one that uses the distinction between non discretionary leadership and discretionary leadership and that demonstrates that it is this very specific component of leadership practices that meets the criteria of a social support variable (COHEN & WILLIS, 1985) buffering the effects of occupational stress.

Beyond this main finding, study 1 adds some evidence to the mediating processes in discretionary leadership — strain reduction relations. We have found, that among the various components of discretionary leadership it was the support component the most important one in reducing stress effects.

Although the variable set of discretionary leadership did not produce main effects on the dependent variables it was found that the support component in the equation combining additive and multiplicative effects of discretionary leadership and job attitudes, the discretionary support component had a significant main effect. The discretionary support was also found to interact with task difficulty and with attitudes toward superiors and career. In other words: the more difficult are the tasks and the less favourable or the attitudes towards the superiors and towards the career, the more stressful will be the lack of support. Second in importance was the discretionary leadership behaviour of rules and procedures enforcement. It was found that the more difficult and less specialized are the tasks the more stressful will be felt this kind of leadership practice. The third component of discretionary leadership found to buffer the stress factors was the one related with work assignments. In this last mediation process the results show that discretionary work assignments made by less respected leaders are likely to induce more strain on subordinates.

## STUDIES 2 AND 3

At this point we find advisable to test the effectiveness of this pattern of relationships with different populations. In addition we also consider that a structural model of stress in organisational settings requires the inclusion of both macro and micro-variables and must also assess the outcomes of strain in performance and turnover. A recent model integrating the various components is the one proposed by Parasuraman and Alutto (1984).

Part of our research program during the year of 1987 was dedicated to prepare the ground for defining and testing a structural model that would meet the requirements stated by Cohen and Wills: «The optimal study would use a large sample with reasonable distributions of stress and support, instruments with acceptable psychometric characteristics, stress and support measures that are not confounded, and optimally a longitudinal design with appropriate prospective analysis» (1985, p. 319).

One of the studies used a simplified version of the multipurpose questionnaire (\*) used in the 1986 with marines a sample of 58 respondents occupying managerial and supervisory positions in both private and public firms, in Lisbon, were the subjects. The purpose of the study was to investigate at what extent the results of the marine study would also hold in a population with different characteristics.

Due to the small size of the sample no attempt was made of testing buffering effects. As alternative we used path-analysis in order to evaluate links between the various sets of variables of the questionnaire. The pattern of relationships examined is shown in Fig. 1.

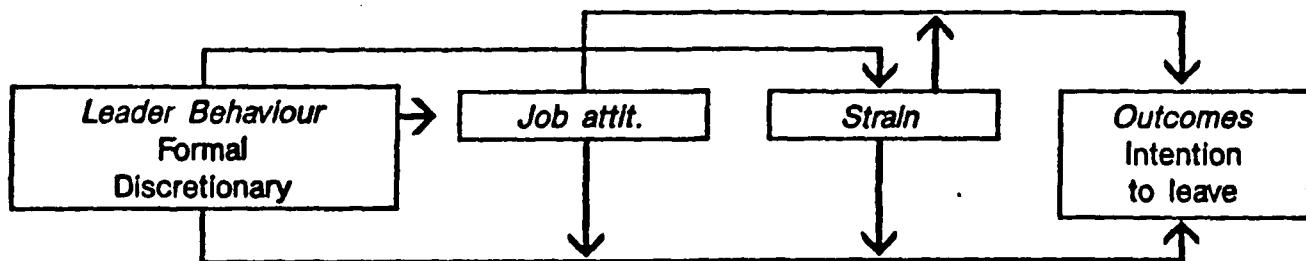


Fig. 1 — Pattern of relationships between antecedents and consequences of strain

(\*) Due to the homogeneity of the sample items describing task and characteristics and system of rewards were suppressed.

The model posits a causal link between the behaviour of leaders and both attitudes toward job and stressors. Another difference as compared with the previous study with marines is the link established between the stressors and the outcome of intention to leave. The results, show that significant direct paths are always found in some of the component factors of the variables sets of the system.

Table 7, summarizes the main findings of the several path analysis., «Intention to leave» is significantly explained by a causal chain linking the leadership behavior with job attitudes and stressors. Comparing the sub-tables 7.3 and 7.4 with sub-table 7.5 it may be seen that the sub-totals almost add indicating that leader behavior, at one hand, and both job attitudes and stressors, at the other hand, are independent components of the total explained variance.

TABLE 7  
TOTAL EFFECTS (% OF EXPLAINED VARIANCE) OF ANTECEDENT VARIABLES  
ON JOB ATTITUDES AND OUTCOMES

7.1

Antecedent variables	Attitudes towards job				
	Work	Chief	Colleagues	Salary	Career
<i>Leadership behavior</i>					
Formal	16.0	37.2	25.2	23.7	17.7
Discretionary	8.8	8.9	8.5	2.4	18.0
Total	24.8	46.1	33.7	26.0	35.7

7.2

Antecedent variables	Stressors			
	On the job events	Life events	Organisational stress	Felt stress
<i>Leadership behavior</i>				
Formal	15.0	16.6	20.8	25.3
Discretionary	12.8	0.1	11.4	12.2
Total	27.8	16.5	32.3	37.5

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**7.3**

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Antecedent variables	Intention to leave
<i>Job attitudes</i>	
Work	5.2
Chief	-1.6
Colleagues	3.2
Salary	.3
Career	20.0
Sub-total	27.1
<i>Stressors</i>	
On-the-job events	1.4
Life-events	5.4
Organizational stress	-1.7
Felt stress (strain)	6.5
Total	38.6

---

**7.4**

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Antecedent variables	Intention to leave
<i>Leadership behavior</i>	
Formal	21.7
Discretionary	4.2
Total	26.0

---

**7.5**

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Antecedent variables	Intention to leave
<i>Leadership behavior</i>	
Formal	22.2
Discretionary	-1.9
<i>Job Attitudes</i>	
Work	-0.1
Chief	-3.4
Colleagues	5.0
Salary	4.3
Career	27.5
Sub-total	33.5
<i>Stressors</i>	
Life-events	6.8
Organizational stress	-3.7
Strain	7.6
Total	60.1

---

Here, again, the role of the discretionary variables is not to explain main effects but interaction effects which can not be analysed with this reduced samples. Anyway, the results support that discretionary leadership is not supposed to be directly related either with causes or consequences of stress. In addition discretionary leadership is related, at same extent, to the attitudes toward career. More specifically, examining the partitioning of variance for the discretionary factors, we found that it is the support component (path coefficient  $p = -.136$ ) that accounts for 15,1% of the total 18,0% explained variance. That is to say, the more the leaders deny their discretionary support to subordinates the less prospects the later see in their future career. The formal component of leadership behavior related to the attitude towards career is «role clarity».

In practical terms, it seems that a certain organizational indefinition of roles combined with lack of support from superiors could be critical to the career of the individuals. As regards the other job attitudes examined it is, as a rule, the formal leadership behavior that accounts for twice or three times the total amount of the explained variance.

More specifically, attitudes towards work are accounted by formal components of consideration ( $p = .29$ ) and credibility of superiors ( $p = .25$ ) and by discretionary role clarity ( $p = .27$ ).

Attitudes towards superiors (chief) were largely accounted by role clarity either formal ( $p = .73$ ) or discretionary ( $p = .13$ ) and, in second place, by bureaucratic technical expertise ( $p = .26$ ). It seems that clarifying the roles of subordinates is, by far, one major cause for developing a positive attitude toward superiors. Attitudes toward colleagues, a variable that expresses at same extent the group atmosphere, is accounted, in first place, by the formal consideration behaviour of leaders ( $p = .32$ ), formal support ( $p = .29$ ) and discretionary role clarity ( $p = .33$ ). Finally, attitudes towards salary are accounted almost exclusively by the formal resources ( $p = .58$ ).

In summary it appears that, not only, role clarity but also bureaucratic expertise and resources are important to induce attitudes towards job, significantly.

Looking, now, to the relationship between leadership behaviour and the stressors (sub-table 7.2) it seems that the first dependent variable - on. the. job events - is explained both by formal and discretionary procedures. More specifically, it was found that bureaucratic expertise ( $p = .038$ ) and consideration ( $p = .33$ ) were the formal attributes while work assignments ( $p = -.44$ ) was the discretionary variable that most accounted for its total variance. In other words, it appears that bureaucratic expertise of superiors is negatively related, while consideration is positively related, with amount of stressful job events.

On the other hand, the discretion of superiors in assigning tasks could reduce the amount of stressful job events. This result is somewhat intriguing. A post-hoc explanation may be suggested. Bureaucratic expertise is a way of reducing ambiguity and thus of reducing potential stressful conflicts. It is less difficult to explain how organisational consideration could contribute to raise the level of on-the-job events.

For life events out-of-the-job, and unrelated with the organisation, the only significant factor found was formal role clarity ( $p = .52$ ) accounting for 11% of total variance, but there is no logical relationship between these two variables.

Organisational stress was accounted by leader resources ( $p = .37$ ), role clarity ( $p = .36$ ) and discretionary reinforcement of rules and procedures ( $p = .59$ ). In other Words, the major complains about the organisation would be caused by lack of resources, role ambiguity and also by discriminatory use of rules and procedures.

Finally the strain of subordinates was found to be significantly accounted for by formal lack of consideration ( $p = .47$ ), lack of contact ( $p = -.26$ ) and lack of credibility ( $p = -.38$ ) and also by discretionary work assignments ( $p = -.30$ ).

Leadership practices were the most important antecedent of strain since the remaining stressors do not significantly increase the amount of explained variance.

Combining, now, the successive blocks of the model (see sub-table 7.5) it may be seen that it is formal leadership and attitudes towards career that mostly account for the total amount of variance of intention-to-leave, immediately followed by strain. Within formal leadership it was found that significant factors were lack of resources ( $p = .44$ ), unfair work assignment practices ( $p = .27$ ) and lack of consideration ( $p = .30$ ).

We may conclude that an organisational outcome like intention to leave may be significantly explained by leadership practices either, directly or indirectly, through job attitudes and strain. Path analysis, suggests which are the leadership mediating practices most likely associated in each particular causal link.

#### Discussion of the Correlational Studies Results

In the marine study we were primarily interested in testing the buffering effects of discretionary leadership, while in the managerial study the focus was on causal links between strain and organisational outcomes.

Both studies contribute empirical evidence to the, very obvious, premise that different behavioural settings are mediated by different leadership practices. In the military setting it is the leaders support that most significantly interacts with stressors buffering their effects. In the managerial setting support is less important than other leadership mediating processes.

For example, factors like resources, credibility or bureaucratic technical expertise, relevant in the managerial setting had no weight in the marine study.

Another major difference between the results of the two studies is the role played by strain and intention to leave, as dependent variables: while in the marine study strain captured most of the explained variance, in the managerial study this is a relatively marginal factor mediating leadership practices, job attitudes and intention to leave.

This diversity of findings lead to suggest that general models of mediating organisational processes are difficult to establish. As a matter of fact each behaviour setting seems to be characterized by its own logic. May be the traditional epistemological orientation of seeking efficient causes at any cost must be replaced by new different research strategies like the ones favouring configurational approaches to causality. In other words, we may only posit probable relationship between stressors, social support and strain. The specific patterns of relationships between these factors are contingent on the specific systems and sub-systems where they occur.

The above is also supported by the study of a sample of 30 firemen in which the main finding is the disproportionate high level of organizational stress. (See table 8). In this particular case it seems to be a direct consequence of strong authoritarian leadership practices, a formal factor.

Table 8  
Basic Statistics Of Stress Variables (Stress Scales)

	1 Marines		2 Firemen		3 Civilians	
	X	SD	X	SD	X	SD
ON-THE-JOB STRESS—STR1	0.95	1.3	1.50	1.22	0.90	0.91
OUT OF THE JOB STRESS—STR2	0.77	0.74	0.90	1.25	0.71	0.73
ORGANIZATIONAL STRESS—STR3	3.71	2.44	7.8	2.05	6.76	3.68
STRAIN (SYMPTOMS)—STR4	5.73	4.63	9.5	3.64	7.41	4.53
ESTIMATED STRAIN—STR5	1.70	2.95	2.1	1.03	—	—

## LONGITUDINAL STUDIES

In study 4 we tried to approach the occupational stress processes using other patterns of variables and measurements. It is our conviction that a multi-method approach to a rather complex process like the one related with causes and consequences of occupational stress, is most likely to provide the building blocks for more comprehensive models even if they are to be taken within the limits of a specific configuration.

In study 4 we turn to factors such as personality and group processes, not examined in our previous research, as there seems to exist substantial evidence that both factors produce effects on stress perception and on stress consequences, as well.

The sample was the total population of a Naval Reserve Marine Cadets course of nine months. We posited that strain would decrease along the course as a consequence of better adaptation to the environmental conditions. New stress measurements were also introduced, namely those ones based on the sequential appraisal method introduced by Shalit (1982).

The idea of adding this measure was to determine at what extent cognitive processes mediate the symptoms reported by the subjects.

The results show, in first place, that personality measures were not significantly related with felt stress. However it is worth to recall the cadets in order to be selected for this officer training course must meet demanding standards of emotional stability.

Even though, factors like depression, social introversion and less positive self-images are more related with symptoms, at least in the initial stages of the training, when the cadets are more vulnerable to stressors. On the other hand, situation appraisal was found to be moderately related with self-concept dimensions. These two findings suggest that personality variables may also contribute to moderate the effects of stress, moreover when the situation is new for the subjects.

In which concerns the social support provided by group acceptance it was detected that it is in the beginning of the training course that social acceptance is more important to reduce anxiety. On a second stage of the training, subjects shift their concerns to physical and psychological fitness.

The same findings are coherent with the appraisal Shalit measures. Subjects, improve their ability to structure the situation but they loose motivational and emotional involvement which, as hypothesised, may introduce a new source of stress.

The results of this study seem therefore to contribute to highlight the need of more sophisticated models of stress processes. Particularly relevant is the finding that the very process of coping during the first stage of adaptation may lead, in its turn, to new sources of stress.

## QUASI-EXPERIMENTAL STUDY-STUDY 5

Apart from this particular study we have also designed a research program, in which most of the previous findings were incorporated.

In broad lines it is a quasi-experimental design where the independent variable is the leadership style of petty-officers shaping the training of marine ratings. We establish as premiss that the manipulation will make a difference in the felt stress of trainees and in their performance and satisfaction.

To that we turn now, in more detail, as an intermediate step to try to build a model of leadership under stress.

# ***Towards a model of leadership under stress***

## **LONGITUDINAL STUDY WITH MARINE TRAINEES**

### **PROCEDURE**

The procedure consisted in studying the two first levels of the training courses at the Marine School: The Basic Military Instruction (IMB), attended by recruits, and the Basic Technical Instruction (ITB) that is attended afterwards by the most successful at the IMB.

Both training courses last 12 weeks and each course comprises six platoons. In each platoon the trainees are closely oriented and supervised by a petty-officer assisted by three chiefs of section.

The design consisted in allocating the six platoons of each course to two conditions: three platoons in the experimental and three in the control condition.

In the experimental condition the treatment consisted in giving a specific training to the supervisors. It was explained that due to operational reasons it would not be possible to include all the supervisors in the same training course. The aim of the study was to verify at what extent the training in leadership behavior would have effects on the performance, stress levels and job attitudes of the trainees.

The leadership training sessions, all of them conducted by the authors, followed the following pattern:

(1) The supervisors were exposed to a group discussion on stress reactions. They were invited to recall personal experiences, some of them from the colonial war period, and also to illustrate with critical incidents from previous courses.

(2) Group discussion about the training doctrine followed at the Marine School, revealed that informal practices such as mild corporal punishments — push-ups, mud pist, etc. Are currently used by the instructors and are considered very instrumental to enforce the discipline habits.

(3) Lectures on leadership based on the situational model of Hersey and Blanchard, focused, in particular, on the dynamics of developing the subordinates through modeling techniques.

Specific instruction about the concept of maturity level and how to use it in training followed.

(4) The supervisors were trained in shaping the behavior of the subordinates:

— By partitioning the final objectives of the instruction, in daily or weekly objectives, for each trainee.

They should give information to the trainee about results and to reinforce always whatever was better than before (only positive reinforcement) and not to stop when the school standard was achieved.

— Adapting their leadership behavior to the successive maturity levels of the subordinates.

(5) Apart from the specific lectures and group discussion sessions, the supervisors were periodically contacted and encouraged to follow the recommended shaping techniques.

## INSTRUMENTS

Measures of the maturity levels of the trainees were taken in the experimental condition as evaluated by the supervisors.

The scale used was adapted from Hersey and Blanchard (1982). It consists of two sub-scales, one of physical maturity and the other of psychological maturity, each one with five items of eight points each.

Measures of performance levels of the trainees were supplied by the staff. They comprise the classifications given by the various instructors of the School.

The trainees were asked to answer a multipurpose questionnaire including measures of leadership behavior, stress levels and job attitudes, (see table 3)

The trainees on, both experimental and control conditions, were measured in three moments: at the beginning, at the middle and at the end of the instruction course.

## SUBJECTS

### *IMB training course*

Experimental condition — 3 platoons comprising 9 supervisors and a total of 101 trainees.

Control condition — 10 trainees chosen at random from three platoons amounting to 30 trainees.

### *ITB training course*

Experimental condition — 3 platoons comprising 9 supervisors and a total 81 trainees.

Control condition — 3 platoons comprising a total of 79 trainees.

# I STUDY

## IMB TRAINEES

The IMB course is the first contact candidates have with the Marine School. It therefore corresponds to the first stage of the organizational socialization. Moreover, candidates initiate a very hard period of physical training and of new disciplinary habits. The IMB lasts 12 weeks and alternates physical exercises with classes about the various subjects of the course.

## RESULTS

Supervisors evaluated periodically the physical and psychological maturity of their subordinates, at the 2nd the 5th, the 7th and 9th week. The mean scores show the following trend:

Physical Mat.	18.447 / 25.573 / 30.301 / 37.447
Psychological Mat.	19.019 / 25.330 / 30.058 / 31.990

Univariate F test for both measures show significant linear and curvilinear trends. The overall multivariate test show that the maturity measures, as a whole, show a significant trend.

The correlations between physical and psychological measures of maturity, are shown in table 9.

TABLE 9  
PM correlations between Physical and Psychological Maturity in the IMB course

	1	2	3	4	5	6	7	8
1 Physical (2)	1.000							
2 Physical (5)	0.413	1.000						
3 Physical (7)	0.080	0.856	1.000					
4 Physical (9)	-0.003	0.795	0.957	1.000				
5 Psychological (2)	0.922	0.500	0.210	0.142	1.000			
6 Psychological (5)	0.304	0.911	0.830	0.805	0.494	1.000		
7 Psychological (7)	-0.013	0.796	0.944	0.951	0.164	0.868	1.000	
8 Psychological (9)	-0.054	0.750	0.912	0.969	0.124	0.818	0.966	1.000

Because supervisors tend to give the same ratings on physical and psychological dimensions, it is important to examine the results of behavior shaping to verify to what extent supervisors succeeded in establishing realistic goals to help the trainees.

TABLE 10  
Average Goals Recommend By Supervisors Versus Actual Results Obtained By IMB Trainees

Week	TESTS							
	SWIMING		PUSH-UPS		MUD PIST		CONTROL PIST	
Week	Rec.	Actual	Rec.	Actual	Rec.	Actual	Rec.	Actual
2	44.058	32.596	8.112	5.963				
3	50.038	38.048	9.218	7.657	12.262	13.663	11.765	13.146
4	59.969	55.510	9.938	9.958	12.404	12.719	11.719	11.796

Multivariate profile analysis shows significant trends in all the tests, confirming that supervisors were able to establish realistic goals, with minor exceptions. Table 11 summarizes correlational analysis between maturity of trainees and differences of pre-established goals and actual results.

**TABLE 11**  
**PM Correlation Between Maturity Levels Of IMB Trainees At The End Of 2nd And 5th Weeks**  
**And Differences Between Recommended And Actual Results Over The First Period Of IMB**  
**Training**

Tests	Physical	Maturity	Physical	Maturity
<b>Swiming</b>				
2	.020	-.290	-.066	-.272
3	.001	-.392	-.095	-.357
4	-.488	.171	-.400	.241
<b>Push-Ups</b>				
2	-.413	-.202	-.365	-.185
3	-.502	-.059	.416	-.019
4	-.553	-.024	-.422	.135
<b>Combat Pist</b>				
3	-.017	.560	.025	.519
4	.048	-.389	-.032	-.425
<b>Mud Pist</b>				
3	-.222	-.222	-.158	.398
4	.005	-.605	-.687	-.082

The results suggest that the goals recommended by the supervisors were not related with the evaluations made about maturity levels. This does not mean that recommended goals were fixed at random, but that supervisors tried to adjust the goals in function of the previous achievements of trainees. A possible explanation could be that supervisors have not tried to match the maturity levels with performance goals.

Next, the supervisor leadership behavior as perceived by the trainees both in the experimental and control conditions, in analysed.

Univariate and multivariable measures analysis of variance show that only in work assignments a difference was found within subjects ( $F = 4.300$   $DF = 1,124$   $P = 0.040$ ) meaning that leaders tend to decrease the amount of task specifications over time in both experimental and control conditions.

The next question is: to what extent the experimental manipulation induced effects on the dependent variables: final performance ratings, stress levels and job attitudes.

**TABLE 12**  
Final Rating Of IMB Trainees Under Experimental And Control Conditions

Tests	Experimental			Control			T	P
	M	SD	N	M	SD	N		
1. Progress	73.339	6.478	101	71.404	6.836	29	1.400	.164
2. Evaluation	68.822	10.561	102	66.024	9.284	30	1.309	.193
3. 6 Km.	60.155	8.337	97	64.833	14.413	30	2.222	.028
4. Readiness	88.188	13.273	101	86.000	25.610	30	.624	.533
5. Mud	90.657	12.072	99	90.833	18.620	30	.061	.951
6. Aerobics	79.798	9.634	99	86.00	9.685	30	3.085	.002
7. Push-ups	60.606	8.153	99	64.333	15.298	30	1.748	.083
8. Abdominals	79.949	12.847	99	79.667	14.794	30	.102	.919
9. Swimming	54.949	10.733	98	54.667	11.740	30	.123	.902
10. Shooting	72.299	8.878	103	71.829	7.254	30	.165	.791

In the large majority of the test, no differences were found between conditions. The only exception (6 Km, mud and aerobics) are in favour of the control group. This results is contrary to the initial predictions (Table 12).

**TABLE 13**  
PM Correlations Between Final Rating And Maturity Levels In The IMB Course

RATINGS	PHYSICAL MATURITY	PSYCHICAL MATURITY
1. Progress	.370	.376
2. Evaluation	.370	.387
3. 6 Km	.030	.054
4. Readiness	.066	.121
5. Mud	-.128	-.088
6. Aerobics	.251	.304
7. Push-ups	-.026	-.043
8. Abdominals	.035	.016
9. Swimming	.003	.121
10. Shooting	.445	.467

The pattern of correlations between physical and psychological maturity, in table 13 also shows that final results of the trainees are scarcely related to maturity evaluations made by the supervisors. We may conclude that the experimental manipulation was not entirely successful in this study.

The results of stress levels over time, for the experimental and control conditions are reproduced in table 14.

**TABLE 14**  
**Cell Means And Standard Deviations Of Stress Variables Of IMB Trainees**

Variables		T1		T2		T3		M	SD	N
		M	SD	M	SD	M	SD			
Job events (STR 1)	Control	2.300	1.264	30	1.793	1.082	29	1.133	1.074	30
	Exper.	2.429	1.499	105	1.245	1.230	102	.824	1.019	102
Life events (STR 2)	Control	.833	.791	30	1.069	.799	29	1.167	1.020	30
	Exper.	.724	.826	105	.716	.905	102	.775	.716	102
Organization (STR 3)	Control	5.400	1.993	30	5.759	2.029	29	6.100	2.057	30
	Exper.	4.895	2.327	105	4.373	2.053	102	4.922	2.255	102
Strain (STR 4)	Control	3.300	4.458	30	8.517	4.556	29	7.000	4.267	30
	Exper.	8.962	5.392	105	7.824	4.563	102	7.167	4.396	102

The results of the multivariate analysis — repeated measures model — show that job-events (STR 1) are less stressful in the experimental condition and tend to decrease over time in both conditions. No interaction effects were found, meaning that decreasing effect is similar in both conditions.

On its turn life events (out of the job — STR2) are higher in the control condition and tend to increase in both condition overtime. No interaction effects were found.

It is worth noting, and this also applies to job events, that levels obtained are extremely low showing that for this population the exposure to episodic stressors is very rare. In practical terms the only source with some visible impact and, even though, with modest levels, is the organizational stress — STR3.

**TABLE 15**  
**Repeated Measures Analysis Of Variance For IMB STR 3 Levels**

SOURCE	DF	MS	T	P
<i>Between subjects</i>				
Condition	1	74.745	9.487	0.003
Error	124	7.870		
<i>Within subjects</i>				
linear	1	4.983	1.280	0.260
error	124	3.894		
quadratic	1	0.006	0.002	0.963
error	124	2.715		
<i>Interaction</i>				
linear	124	3.894		

As is shown in table 15 we found differences between conditions and over time. Organizational stress is higher in the control group and tends to increase over time in both conditions. No interaction effects were found.

**TABLE 16**  
**Repeated Measures Analysis Of Variance For IMB STR4 Levels**

SOURCE	DF	MS	T	P
<i>Between subjects</i>				
Condition	1	1.222	0.025	0.875
Error	124	49.452		
<i>Within subjects</i>				
linear	1	23.603	3.013	0.085
Error	124	7.835		
Quadratic	1	12.695	2.434	0.121
Error	124	5.217		
<i>Interaction</i>				
linear	1	3.115	0.398	0.529
error	124	7.835		
Quadratic	1	14.616	1.801	0.097
error	124	5.217		

The repeated measures multivariate analysis of strain (STR4) shows no differences between conditions but only over time: symptoms tend to decrease over time. A marginal quadratic interaction effect was found reflecting that strain in the control condition increases from T1 to T2 and then decreases from T2 to T3. (table 16)

In order to have another measure of the strain levels the General Health Questionnaire (GHQ12) was used twice, at moments T1 and T3.

Univariate and multivariate tests show that there are no significant differences between conditions.

The various results of the stress variables indicate that stress levels are, as rule, lower in the experimental condition and also that they tend to decrease over time. In the case of organizational stress it tends to increase over time. Supervisors in the experimental condition were, thus, instrumental in buffering the effects of stressors, namely, of those induced by the enforcement of organizational rules and procedures.

The results of variables related with job attitudes as measured by the Job Description Index (JDI) scales, administered to the trainees at moments T1 and T3, are shown in table 17.

Repeated measures multivariate analysis for each job attitude shows the following:

- Work: The favorableness of overall work conditions increases over time.
- Chief: There is a more positive attitude towards supervisors in the experimental condition.
- Collg: The attitude towards colleagues is, also, more positive in the experimental condition.
- SRL: There are no differences between the experimental and control condition. In both conditions, attitudes towards salary become less positive over time and even at a great extent in the control group.
- Career: No differences were found between conditions or over time, for attitudes towards career.

In summary, we may conclude that in general, job attitudes are more favorable in the experimental condition and also that they tend to improve over time with the exception of the attitude toward salary. But even in this case decrease is less accentuated in the experimental condition.

TABLE 17  
Cell Means And Standard Deviations Of JDI Scales For IMB In Time T1 And T3

VARIABLES		T1		N	T3		N
		M	SD		M	SD	
WRK	Control	22.300	4.087	30	24.133	5.097	30
	Experim.	21.689	5.880	106	24.971	4.550	102
CHIEF	Control	24.900	5.169	30	25.433	6.796	30
	Experim.	26.094	4.618	106	24.755	4.653	102
COLIG	Control	21.133	6.426	30	20.300	6.513	30
	Experim.	23.255	4.506	106	22.990	5.234	102
SLRY	Control	3.700	2.781	30	2.333	2.171	30
	Experim.	3.000	2.736	106	2.569	1.988	102
CAREER	Control	3.333	2.057	30	3.533	2.330	30
	Experim.	3.962	1.947	106	3.578	2.267	102

#### Discussion

The IMB study seems to fall at the level of the manipulation of the independent variables. Supervisors were instructed to adjust their behavior in accordance with the maturity level of the subordinates but the results suggest that such instructions were not exactly followed. The evidence collected suggests that supervisors were instrumental in reducing the stress level of the trainees and also convening a more favorable image of the organization but, apparently, this strategy had a negative effect on performance. One may hypothesize that supervisors of this IMB course, under the experimental condition, gave too much support to their subordinates.

As it seems, the instructors adjusted the next requirement for each one the trainees to their last score. In doing so they were, merely, reinforcing behavior.

## II STUDY

### ITB TRAINEES

The second period of instruction, the ITB course, is obviously more demanding as compared to the IMB course, but the candidates have now more experience and training, both, in physical fitness and mental habits of study and discipline.

For the present study we have used the entire ITB population: three platoons in the experimental condition and the other three on the control condition, amounting to a total of 160 subjects.

### RESULTS

Supervisors evaluated the physical and psychological maturity of the trainees at the end of the 2nd, 5th, 7th, 9th and 12th week. The mean scores show the following trend:

Physical maturity	17.962	23.570	27.5955	30.747	45.468
Psychological maturity	18.759	23.548	27.734	30.063	31.215

Univariate F tests for both measures show significant linear, as well as quadratic, cubic and quartic trends. The overall multivariate test shows that the maturity measures, as a whole, show a significant trend.

Physical maturity as assessed by the supervisors increases over time and even more from the 9th to the 12th week. Psychological maturity runs parallel to the physical maturity up to the 9th week and then stabilizes.

TABLE 18  
PM Correlations Between Physical And Psychological Maturity In The ITB Course

	P2	P5	P7	P9	P12
F2	.938				
F5		.901			
F7			.682		
F9				.915	
F12					.886

The correlations between physical and psychological maturity (table 18) suggest that raters usually, but not always, equate physical and psychological maturity. The pattern is slightly different from the one obtained in the IMB course (first study).

The extent to which supervisors were able to establish goals for their trainees in order to help them to improvise their performances, is summarized in Table 19.

**TABLE 19**  
**Average Goals In Minutes Recommended By Supervisors Versus Actual Results Obtained By**  
**ITB Trainees**

WEEK	TESTS					
	6 Km		Combat Pist		Mud Pist	
	Recommend	Actual	Recommend	Actual	Recommend	Actual
2	28.125	31.538	11.422	12.466	12.705	13.620
3	28.160	30.012	11.613	11.873	12.794	13.131
4	29.611	29.843	11.034	11.151	12.783	14.595
5	28.777	29.847	10.607	11.029	13.600	12.533
Wilks Lambda		.593		.412		.650
F statistic		7.553		15.235		11.022

The manipulation was well succeed. Recommended goals become more realistic over time and actual results of candidates also improve. Multivariate profile analysis for the computed differences between recommended goals and actual results shows significant trends in all the tests, meaning that supervisors had actually followed the recommendations given by the experimenters.

In order to get a better evaluation of the strategies of the supervisors, a correlational analysis between maturity levels of trainees and differences of pre-established goals and actual results is summarised in the Table 20.

**TABLE 20**  
**Pm Correlations Between Maturity Levels Of ITB Trainees At The End Of The 2nd The 5th Weeks**  
**And Differences Between Recommended And Actual Results Over The Five First Weeks**

Tests	Physical maturity		Psychological maturity	
	6 km	2nd week	5th week	2nd week
2		.454	.193	.421
3		.174	.293	-.007
4		.676	.481	.682
5		.490	.155	.511
Combat Pist				
2		.312	.311	.110
3		.485	.302	.486
4		.416	.156	.007
5		-.239	-.218	-.260
Mud Pist				
2		.367	.293	.112
3		.118	.156	.116
4		-.053	-.049	.007
5		.263	.345	.407

The results suggest that, with minor exceptions, supervisors followed correctly the recommended model of establishing goals for their trainees in accordance with their maturity level.

When we examine how supervisor leadership behaviors were perceived by the trainees, both in the experimental and control conditions, univariate and multivariate repeated measures analysis shows that the only difference found regards the support behavior of leaders. Table 21

TABLE 21  
Repeated Measures Analysis Of Variance For ITB Leadership Support Behavior Of Supervisors

Source	DF	MS	F	P
<i>Between subjects</i>				
Condition	1	267.488	4.265	0.041
Error	143	62.720		
<i>Within subjects</i>				
Linear	1	.028	0.001	0.0971
Error	143	20.398		
Interaction	1	0.414	0.020	0.887
Error	143	20.398		

Support given by leader is higher in the control condition than in the experimental condition.

In all the remaining leadership behaviors no differences were found between the experimental and the control conditions. This result can be interpreted as a differential strategy used by supervisors aimed at delegating more responsibility to the trainees.

The effects of the manipulation on the dependent variables final performance ratings obtained in the course, stress levels and job attitudes — are translated by the following results.

TABLE 22  
Final Ratings Of ITB Trainees Under Experimental And Control Conditions

Courses	Experimental (N = 76)		Control (N = 78)		T	P
	Mean	SD	Mean	SD		
+ C1.	79.263	7.273	76.692	9.637	1.865	.064
C2.	77.612	8.248	77.641	7.431	.023	.982
+ C3.	67.086	6.672	64.712	6.561	2.226	.027
+ C4.	70.991	5.590	67.785	5.227	3.678	.000
+ C5.	72.237	10.466	68.782	11.445	1.953	.053
C6.	83.658	6.052	82.026	8.402	1.380	.170
+ C7.	81.123	8.079	79.026	8.428	1.661	.099
C8.	75.534	6.762	73.705	11.888	.109	.913
C9. Mean	74.905	4.201	73.093	4.730	2.511	.013
+ C10 On job training	78.288	5.829	77.226	5.944	1.120	.265
+ C11. Clas. Final	79.826	6.068	78.015	5.850	1.886	.061

The findings on performance (Table 22) show that the trainees in the experimental condition achieved higher scores in all courses, the differences are statistically significant in seven out of the eleven comparisons made.

Table 23 shows the correlations between final ratings and maturity levels given by the supervisors at the end of the 12th week.

TABLE 23  
PM Correlations Between Final Ratings And Maturity Levels Levels In The ITB Course

Ratings	Physical Maturity	Psychical Maturity (12)
C1	.467	.486
C2	.497	.493
C3	-.125	-.150
C4	.383	.205
C5	.381	.389
C6	.256	.225
C7	.357	.455
C8	.283	.364
C9	.545	.501
C10	.707	.775
C11	.775	.813

The pattern obtained confirms the accuracy of the evalutions made by the supervisors. The results of the stress variables are reproduced on table 24.

TABLE 24  
Cell Means And Standard Deviations Of The Stress Variables Of ITB Trainees Over Time In The Experimental And Control Conditions

VARIABLES		T1			T2			T3		
		M	SD	N	M	SD	N	M	SD	N
Job events (STR1)	Control	.747	1.044	79	2.859	1.078	78	.851	1.244	74
	Experim.	.951	1.011	81	2.329	1.078	82	1.493	1.608	73
Life events (STR2)	Control	.772	.960	79	.615	.810	78	.662	.688	74
	Experim.	.580	.705	81	1.578	.718	83	.603	1.210	73
Organizational (STR3)	Control	3.734	2.194	79	4.321	2.117	78	3.865	2.313	74
	Experim.	4.617	2.596	81	5.060	2.324	83	3.849	2.419	73
Strain (STR4)	Control	6.948	4.055	77	7.128	3.929	78	5.068	3.837	74
	Experim.	6.475	4.009	80	8.265	4.129	83	5.083	4.242	73

Repeated measures multivariate analysis for stress 1 shows that there are no differences between the experimental and control conditions on the job events. For both conditions the stress level increases from T1 to T2 and then decreases from T2 to T3 (quadratic relation). This curvilinear relation is higher in the control group. Life events out-of-job (STR2) shows no main effects nor interaction effects both in experimental and in control conditions. The mean scores are similar and both indicate extremely low level of stressful life events. (Controlling for this factor is important as it permits to discard eventual sources of stress not directly related with the job).

TABLE 25  
Repeated Measures Analysis of Variance for ITB STR3 levels

Source	DF	MS	F	P
<i>Between Subjects Effects</i>				
Condition	1	36.211	3.923	0.005
Error	143	9.230		
<i>Within Subjects</i>				
Over time				
Linear	1	1.174	.428	0.514
Error	143	2.742		
Quadratic	1	13.021	3.509	0.063
Error	143	3.711		
<i>Interaction</i>				
Condition X Overtime				
Linear	1	15.810	5.766	0.018
Error	143	2.742		
Quadratic	1	.598	0.161	0.689
Error	143	3.711		

Organizational stress (STR3) is significantly higher in the experimental condition.

There is a curvilinear overall effect (quadratic), stress increases from T1 to T2 and decreases from T2 to T3 for both conditions. There is also a linear interaction effects showing that, in the experimental condition, there is a decrease while in the control condition there is an increase from T1 to T2. These results suggest that leadership behavior in the experimental condition succeeded in adopting more flexible tactics for handling the organizational stress variables. (Table 25)

TABLE 2C  
REPEATED MEASURES ANALYSIS OF VARIANCE FOR ITB STR4 LEVELS

SOURCE	DF	MS	F	P
<i>Between Subjects Effects</i>				
Condition	1	9.017	0.246	0.620
Error	139	36.587		
<i>Within Subjects</i>				
<i>Overtime</i>				
Linear	1	109.829	28.376	0.000
Error	139	3.871		
Quadratic	1	52.152	7.115	0.000
Error	139	7.330		
<i>Interaction</i>				
<i>Condition X Overtime</i>				
Linear	1	1.657	0.428	0.514
Error	139	3.871		
Quadratic	1	27.597	3.765	0.054
Error		7.330		

For strain (reported symptoms (STR 4) no main effects were found for the conditions. (Table 27) In other words, the experimental group was not different from the control group.

Differences were, however, found in the overall levels of strain over time. The level of strain increases from T1 to T2 and decreases from T2 to T3 both in the experimental and in the control group. A curvilinear interaction effect was also detected, showing that the increase from T1 to T2 and the decrease from T2 to T3 are both steeper on the experimental than in the control group. In order to cross-examine the results for STR4 the General Health Questionnaire (CHQ 12). was also used twice, at moments T2 and T3.

Univariate tests show significant differences between conditions both in time T2 and T3. Multivariate tests also indicate significant differences, confirming that strain in the experimental group is higher than in the control group.

The results obtained for the different measures of stress show that the only one in which differences were found, for the conditions, was organizational stress (STR3). This variable is the one most directly related with day-to-day life along the training course and also the more dependent of the supervisors behavior.

Higher organizational stress in the experimental condition suggests that supervisors exercised a closer control over the trainees, enforcing the discipline, as well as rules and procedures.

The consistent curvilinear effects across the various stress variables suggests, on its turn, that in both experimental and control conditions an increase on stress factors was due to the harder demands of a new and more advanced training course.

In parallel with higher scores on organizational stress it was also found that subjects on the experimental condition showed also higher levels of strain, at least during the transition from T1 to T2. These findings, together with the better ratings achieved by the trainees on the experimental condition, mean that supervisors on the experimental condition were instrumental in raising the stress and strain of their subordinates in order to help them achieving better results.

Job attitudes were measured, using the Job Descriptive Index Scales in moments T2 and T3. (Table 27)

**TABLE 27**  
**CELL MEANS AND STANDARDS DEVIATIONS OF JDI SCALES FOR ITB IN TIME T1 AND TIME T3**

VARIABLES		M	T2	N	M	T3	N
			SD			SD	
WORK	Control	25.0	4.324	78	27.095	4.227	74
	Experimental	23.024	5.289	83	25.080	4.940	73
CHIEF	Control	27.744	4.525	78	27.514	5.810	74
	Experimental	25.976	5.063	83	6.562	4.927	73
COLLG	Control	25.487	5.431	78	24.486	6.196	74
	Experimental	23.289	5.086	83	23.342	6.163	73
SLRY	Control	2.808	2.543	78	2.608	2.476	74
	Experimental	3.096	2.690	83	2.685	2.040	73
CAREER	Control	4.154	2.020	78	3.514	2.160	74
	Experimental	3.783	2.159	83	3.740	2.533	73

Repeated measures multivariate analysis for each job attitude dimensions shows the following:

**TABLE 28**  
**REPEATED MEASURES ANALYSIS OF VARIANCE FOR ITB ATTITUDES TOWARDS WRK**

SOURCE	DF	MS	F	P
<i>Between Subjects Effects</i>				
Condition	1	210.630	6.479	0.012
Error	144	32.509		
<i>Within Subjects</i>				
Over time	1	121.158	11.395	0.001
Error	144	10.633		
<i>Interaction</i>				
Condition X Overtime	1	15.836	1.489	0.224
Error	144	10.633		

WRK: there are differences both between the experimental and the control condition and from moment T2 to moment T3. The overall attitude towards work is more positive in the control group and increases in both conditions over time. (Table 28)

TABLE 25  
REPEATED MEASURES ANALYSIS OF VARIANCE FOR ITB ATTITUDES TOWARDS CHIEF

SOURCE	DF	MS	F	P
<i>Between Subjects Effects</i>				
Condition	1	114.688	3.405	0.067
Error	144	33.686		
<i>Within Subjects</i>				
Over time	1	3.021	0.163	0.687
Error	144	18.480		
<i>Interaction</i>				
Condition X Overtime	1	8.223	0.445	0.506
Error	144	18.480		

CHIEF: attitudes towards supervisors are more favourable in the control group and no change occurs over time. No interaction effects was found. (Table 29)

TABLE 30  
REPEATED MEASURES ANALYSIS OF VARIANCE FOR ITB ATTITUDES TOWARDS COLLEAGUES

SOURCE	DF	MS	F	P
<i>Between Subjects Effects</i>				
Condition	1	195.620	4.229	0.042
Error	144	46.262		
<i>Within Subjects</i>				
Time	1	28.938	1.409	0.237
Error	144	20.538		
<i>Interaction</i>				
Condition X Overtime	1	16.305	0.794	0.374
Error	144	20.538		

COLLG: The attitudes toward colleagues are more favourable in the control group and do not change over time (Table 30).

For the remaining attitudes, toward SALARY and toward CAREER, no differences were found either between conditions or overtime.

In summary, it seems reasonable to conclude that, job attitudes are, in general, more favourable in the control condition than in the experimental condition.

#### Discussion

The results of the ITB study are favourable to the initial hypothesis that training in leadership behavior could lead to better outcomes in the performance of subordinates.

We may presume that trainees at the beginning of the ITB course were not fully aware of the difficulties they have to face. Having successfully completed a training course (IMB) and feeling at ease in a social environment already familiar to them, they would not anticipate new sources of stress and coping.

Situations such as this one require a raising in the stress of the trainees. That is common knowledge for all the leaders. But the ones submitted to the experimental treatment were in fact more effective in enacting this strategy.

### III STUDY

#### FOLLOW-UP IMB AND ITB

One year after the completion of the two studies conducted at the Naval Marine School, a fourth wave of measures of the same variables was taken, this time, at the Portuguese Marine Corps where the trainees are transferred after terminating their training.

The idea was to verify at what extent the differences found in each study between experimental and control groups, and also between studies would be stable over time. Our hypothesis was, at first, that trainees under the experimental condition whose supervisors were trained in applying more effective leadership behaviors, would show more adapted to the actual situation for which they have been prepared. Taking into account the results of the studies and the differences found between IMB and ITB studies we had to adjust the initial hypothesis.

It was anticipated that ITB trainees would show better patterns of adjustment to the life in the military units than the IMB trainees. For testing the hypothesis we have administered the same scales used in the previous studies for assessing the stress levels and leader behaviors. Job satisfaction was measured using one item five point scales (1-not at all satisfactory, 5-very satisfactory) for each dimension: work, superiors, colleagues, salary and career.

In addition two measures of professional merit, consisting of the official classification given by superiors were also taken into consideration the first of these measures-REC- is related to general aptitudes and uses a 5 point scale (0-very poor, 4-outstanding). The second measure is the value for the organization (VORG) and is also a 5 point scale (1-not recommended, 5-strongly recommended). Table 31 summarizes the comparisons made.

The mortality of the initial sample is about 50%. The structure of the samples is however, similar.

No differences were found between subjects coming from the experimental and the control conditions. Between ITB and IMB only two marginal differences were found: in the attitude toward salary where the ITB subjects seem to be more satisfied and in the value for the organization (VORG) where the IMB subjects obtain a better evaluation.

In order to assess some structural overall differences between the two populations we have performed a canonical correlation analysis selecting as independent variables the stressors STR1 and STR2, and the leadership behavior of supervisors, and as dependent variables the organizational stress - STR3, strain STR4, job satisfaction and performance measures (REC, VORG).

**TABLE 31**  
**CELL MEANS AND STANDARD DEVIATIONS OF IMB AND ITB VARIABLES IN THE 4th APPLICATION**

Variables	IMB						ITB					
	M	SD	N	T	P	M	SD	N	T	P	T	P
STR 1	Control	1.250	1.291	16	1.771	.094	.709	.854	55	.583	.161	
	Experimental	.652	.819	69			.811	.962	53			
	Total	.767	.942	85			.759	.906	108			.061 .951
STR 2	Control	1.125	1.258	16	1.437	.169	.709	.712	55	.188	.851	
	Experimental	.652	.801	69			.736	.763	53			
	Total	.744	.910	85			.722	.734	108			.182 .856
STR 3	Control	6.375	3.862	16	1.557	.136	4.873	2.976	55	.941	.349	
	Experimental	4.765	3.052	68			5.434	3.214	53			
	Total	5.059	3.242	84			5.148	3.093	108			.194 .846
STR 4	Control	6.500	6.033	16	.261	.797	5.745	4.287	55	.521	.603	
	Experimental	6.074	5.181	68			6.189	4.541	53			
	Total	6.129	5.291	84			5.963	4.398				.233 .816
WRK	Control	3.200	1.082	15	1.028	.316	2.630	1.104	54	.947	.346	
	Experimental	2.682	1.066	68			2.830	1.067	53			
	Total	2.729	1.064	84			2.729	1.095	108			1.257 .210
CELEP	Control	3.133	.990	15	.118	.907	3.073	0.900	55	.296	.177	
	Experimental	3.167	.970	66			3.019	0.990	53			
	Total	3.146	1.970	82			3.046	.945	108			.713 .477
COLLG	Control	3.467	.640	15	1.055	.303	3.473	.504	55	1.362	.177	
	Experimental	3.269	.730	67			3.263	.885	53			
	Total	3.301	.711	83			3.380	.720	108			.752 .453
SLRY	Control	1.500	.760	14	.447	.661	1.636	.754	55	.560	.576	
	Experimental	1.403	.629	67			1.558	.698	52			
	Total	1.415	.647	82			1.598	.725	107			1.833 .068
CAREER	Control	2.267	1.223	15	.485	.633	2.481	1.059	54	.456	.649	
	Experimental	2.433	1.090	67			2.385	1.123	52			
	Total	2.398	1.104	83			2.434	1.087	106			.226 .84
EC	Control	-0.000	7.519	16	1.552	.135	4.615	8.075	54	1.567	.120	
	Experimental	3.252	7.608	67			2.491	7.255	53			
	Total	2.667	7.616	84			3.664	7.732	107			.892 .374
EP	Control	9.813	9.290	16	.572	.574	10.704	7.275	54	.361	.719	
	Experimental	11.224	6.822	67			10.208	6.935	53			
	Total											.449 .654
WA	Control	2.813	4.086	16	.670	.508	4.037	5.139	54	.103	.918	
	Experimental	3.612	5.042	67			4.132	4.377	53			
	Total	3.429	4.838	84			4.084	4.755	107			.937 .350
SUFP	Control	4.500	6.663	16	1.245	.226	6.667	6.721	54	.344	.731	
	Experimental	6.824	6.935	68			6.245	5.916	53			
	Total	6.294	6.911	85			6.458	6.309	107			.170 .866
REC	Control	2.867	1.060	15	.345	.734	2.815	1.029	54	.655	.514	
	Experimental	2.970	1.000	67			2.941	.947	51			
	Total	2.952	.999	83			2.876	.987	105			.518 .665
VORG	Control	2.933	1.100	15	.361	.722	2.764	0.999	55	.182	.856	
	Experimental	3.046	1.052	65			2.725	1.150	53			
	Total	3.025	1.049	81			2.745	1.070	106			1.750 .675

Table 32 are reproduces the results obtained for the first three equations.

VARIABLES	TABLE 32 STRUCTYURE COEFFICIENTS AND RELATED STATISFICS (CANONICAL CORRELATION)					
	IMB			ITB		
Left	X1	X2	X3	X1	X2	X3
STR1	-.305	.341	-.524	.718	.651	-.005
STR2	-.303	.729	.052	.714	-.458	-.379
RC	.594	-.265	.354	-.167	-.080	-.042
WA	.699	-.088	-.422	-.174	.108	.418
RP	-.667	-.667	-.030	-.352	-.265	.306
SOP	.704	.121	.345	.047	-.614	.698
Right	Y1	Y2	Y3	Y1	Y2	Y3
STR3	.516	.344	.607	-.680	-.094	-.051
STR4	.225	.449	-.107	-.746	-.103	.400
WRK	-.570	.256	-.060	.154	.439	.093
CHIEF	-.738	.017	-.022	.014	.859	.041
COLIG	-.058	.436	-.441	.375	.368	.211
SLRY	.207	-.262	-.073	.196	-.31	.665
CAREER	-.224	-.050	.012	.265	.281	-.192
ITL	-.168	-.192	.270	-.014	-.395	.093
REC	-.325	-.015	.083	.374	.555	.326
V/ORG	-.248	-.183	.018	.327	.487	.032
RC	.641	.459	.335	.641	.547	.429
CHI	75.977	41.373	25.892	108.764	62.032	30.617

The structure coefficients show a different pattern in each sample. In the IMB the most significant relations link leadership behavior with job satisfaction, while in the ITB the most significant relations are those linking the stressors with organizational stress and strain and with performance measures.

These finding, suggest that different dynamics are present in each population: in the IMB population, what seems to predominate, is the instrumental role of leadership processes in promoting job satisfaction, whereas, in the ITB population it is the mediating role of stress and strain and its effects on achievement that appears to be more salient.

## GENERAL DISCUSSION

Initial hypothesis held that leadership behavior could be instrumental in buffering the stress-strain relationship and to produce effects on job satisfaction and performance levels.

Studies 1 to 4 contributed to test part of this model showing that specific leadership behavior can actually attenuate the effects of stress on strain and thus increase the overall satisfaction towards work and superiors. It remained, however, to examine the impact on performance and that was one of the issues addressed in study 5.

The results obtained contribute to clarify the underlying pattern of variables under consideration (See also Table 4).

We have seen that the results of the IMB study are not coincident with, the results of the ITB study. In the IMB study supervisors provided support to their trainees, stress levels decreased satisfaction became higher and performance lower. In the ITB study the opposite was verified: Supervisors provided less support, stress levels increased, satisfaction became lower and performance higher.

The possible antecedent conditions that may explain these different effects have to do with the instructors' behavior: in the IMB study they were less strict in following the instructions given, during the sessions, by the experimenters. In the preparatory sessions the same content was conveyed by the authors, to both groups of instructors but IMB supervisors did not apply the recommended situational model, namely in what concerns the evalution of the maturity levels of the subordinates.

The final results of the studies, although not planned in this way, are even more revealing than if the experimental manipulation had been exactly folowed by both IMB and ITB instructors. Such as the results stand they may be interpreted as two levels of the independent variable, that is to say, as two levels of the supportive behavior of the supervisors, each one of them leading to opposite effects in the intermediate and dependent variables.

Indeed, when support varies, the level o strain varies in the opposite direction. The greater the support the less the strain and vise-versa. Then, performance and satisfaction are affected, as a consequence low levels of stress are prone to increase satisfaction but to decrease the performance level. High levels of stress may be required to enhance performance but they are susceptible to decrease satisfaction.

The relashioship between performance and satisfaction - insatisfaction are frequently puzzling in organizational studies, as none of the two sets of variables are predictive of the other. Many aspects of the organizational sething, as well as, person and interpersonal variables, e have been called for without sucess, in order to explain divergent results.

Our studies strongly to the point impotance of organizational stress and strain to explain the organizational behavior output. From the statistical standpoint, strain, in the correlational studies, absorbed most of the explained variance. In addition, the quasi-experimental studies provided substancial evidence that the managment of strain is the most dynamic intermidiate variable.

*In conclusion*, we have detected, in the full set of studies reported here, a series of situations in which strain raises. They have to do with job requirements, organizational characteristics, the leader and the colleagues behaviors and also with variables like salary and career prospects.

When strain increases by the combined action of such sources, satisfaction and performance are affected. At first, both of them increase. In fact in situations characterized by a very low level of stressors, people are unsatisfied and their performance is below the required standards. On the contrary, when strain becomes very high, both satisfaction and performance deteriorate. We have reasons to believe that satisfaction is the variable that, usually, decreases in the first place.

In the correlational studies we limit our search to find out the effects of stress on satisfaction, and we determined that leaders are instrumental in reducing the stress levels when they provided support to their followers. The same comes about when the support comes from the colleagues (or, for that matter, from any other person or persons).

Such findings could be used to recommend that leaders should strive to reduce the stress of the subordinates no matter the specific organizational constraints. But, when we examined the relationship among stress levels, satisfaction and performance, in the longitudinal studies, it became apparent that there may be a negative correlation between satisfaction and performance. As a consequence, the leader has to find out how to manage the trade-off between those two variables. It was, also, determined that leaders do that when they provide or withhold support.

It becomes apparent that the followers' strain is a crucial intermediate variable which may be managed by the leaders' behavior in order to regulate the trade-off of the two output variables, satisfaction and performance (Fig. 2).

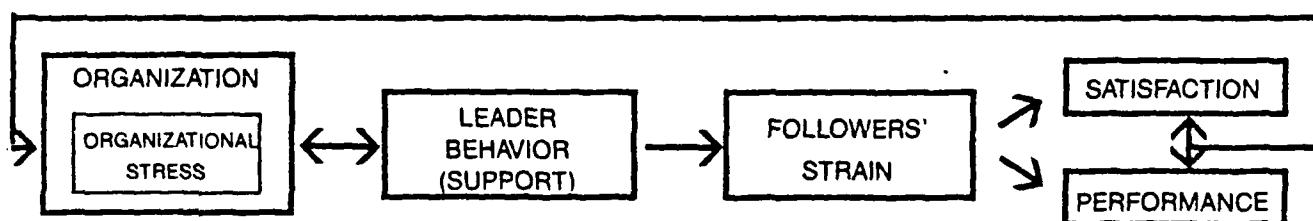


FIG. 2  
A MODEL OF DISCRETIONARY LEADERSHIP UNDER STRESS

When the leader is not effective in accomplishing the mediating function, the outcome is an increase in organizational stress. The results of the leader's behavior in the follower's satisfaction and performance, kind of backfire to the organizational level. As a consequence the leader's behavior tends to be confounded with the formal organizational constraints (Fig. 3).

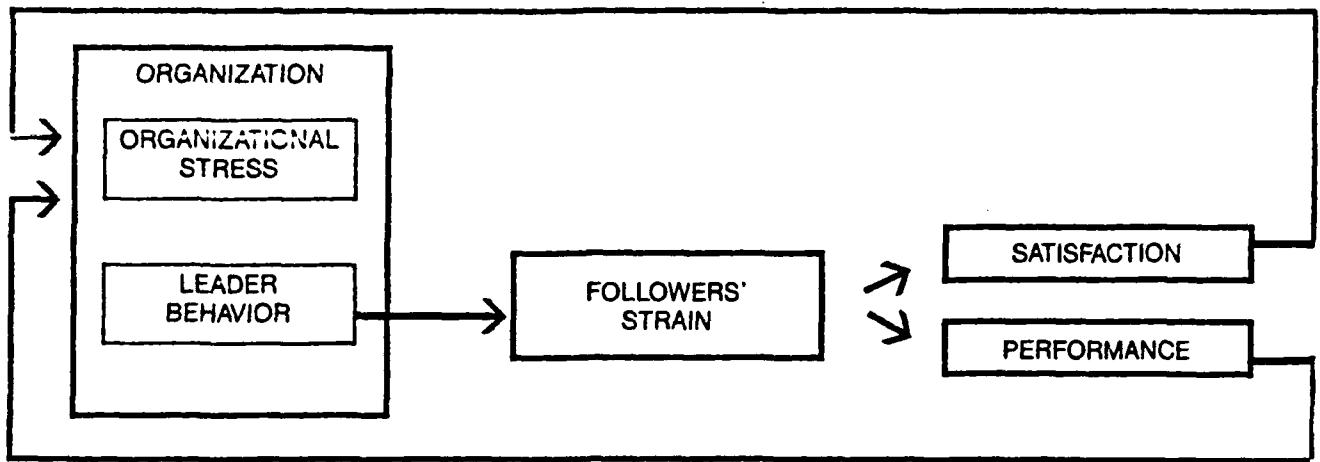


FIG. 3  
ALTERNATIVE MODEL OF FORMAL OR AUTHORITARIAN LEADERSHIP UNDER STRESS

The alternative configuration of the variables and of their relationships, postulated in Fig. 3 is consonant with our findings in the studies with civilians and firemen. The leaders were not effective, performance and satisfaction were both low and organizational stress was high.

Formal leadership and, most of all, authoritarian leadership are very different from discretionary leadership. Indeed, in order to be discriminative leaders have to go beyond the formal power endowed by the organizational specifications and to deal with each follower (or group of followers) in a personal basis. Only then, leaders emerge as distinct figures from the organizational background. Only then, leaders are envisaged, by the followers, as a source of personal power, orientation and support. Only then leaders may be credited with the capacity to correct the organization excesses, contradictions and ambiguities.

Stress, as H. Selye (1983), repeatedly, stated «is a non-specific reaction of the organism to any demand». The same demand may produce the reaction with different degrees of intensity. That may depend in the state of the organism at the moment but, it depends also on the perception of the situation. We have found out that leaders do change the followers perception of the situation, but they are also part of the situation. As such, they may be perceived either, as mere transmission belts of the organization, or, as persons that act by themselves in between the organization and the followers. The latter perception is a pre-requisite to become an discretionary leader.

In the first correlated studies, with marines, we found out that discretionary leadership variables had strong interaction effects with the task characteristics and job attitudes, suggesting that to have some discretion leaders have to act upon the organizational specified procedures. In addition, leaders have to be considered as professionally competent to gain credit among their men.

A similar pattern was found in the longitudinal studies. In all the studies with marines, it was support that best explained, both statistically and substantioially, the strain of subordinates.

With firemen and in the manageriae setting the pattern of the interrelationships was different from the above, as it were also the behavior, the competence, and the credit of the leaders. Here support is less important than ressources, credibility and bureaucratic technical expertise, and the greatest amount of the predictores variance is not absorbed by strain but by intention to leave the organization. Organizational stress is, thus, very high.

All in all, our results are favourable to the two alternative configurations depicted in figs. 3 and 5, and the model of leadership under stress, here advanced, is instrumental to explain the trade-off between performance and satisfaction as outputs of organizational behavir. The crucial role of strain as an intermidary variable betwen the above ones an leader behavior is, perhaps, the most inovative contibutin of the present studies.

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